The Planters' Chronicle.

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THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The report of the Government Entomologist is continued and deals with Coorg. As the importance of bees is recognized for fertilising purposes, it remains with planters themselves to prohibit the destruction of combs within the limits of their estates.

The Scientific Officer writes on Scale Insects and advises spraying as the cure. He concludes his article with an anecdote full of meaning to those who can appreciate its significance.

The Proceedings of the Wynaad Planters' Association are printed. In the Annual Report the question of Labour and Emigration is dealt with which shows how difficult a problem the Labour Committee has to solve.

The use of explosives in all agricultural pursuits is looming large and occupying the attention of practical farmers all the world over and we hope that the Planting Community of Southern India will give the suggestion a trial and publish in our columns the cost of such experiment, for the benefit of the industry at large. It is the difference of cost between explosive and manual labour we are anxious to arrive at. The results we have no doubt about.

We have been asked to publish the following which we have much pleasure in doing:—"In the course of demolition of the last of the old buildings of the Lalimli Mills, this week, to make room for another modern Mill, workers came across a toad securely imbedded in the mud wall, and alive. As the building was erected 30 years ago, there can be no question that the toad has existed in the small pocket formed by its body for that period without air or food. It is now contentedly reposing in a sealed bottle buried in the earth and is the object of much curiosity."

Several well known planters have been passing through Bangalore. Mr. St. John Hunt who was on his way from home was taken seriously ill but is now convalescent.

Mr. and Mrs. F. M. Hamilton are passing through on their way to England and we wish them *bon voyage*.

Mr. Murray Aynsley is staying for a short time in Bangalore and his friends will be glad to know that he is in the best of health.

BEES AND THE FERTILISATION OF COFFEE.

[*Continued.*]

Report of the Government Entomologist on a tour in Coorg.

"My visit to Coorg was brief and hurried and gave little opportunity for detailed investigations. The three species of Honey-Bee mentioned above occur. *Apis dorsata* (The Rock Bee) in this district seems to build on trees rather than on rocks, returning year after year to the same tree, or group of trees, upwards of a hundred combs being sometimes suspended from the branches of a single tree. I saw such a favourite tree on Fairlands Estate, although at the time of my visit it did not contain more than about 30-40 combs, and these all unoccupied, showing that migration is also the rule in this locality. From inquiries it appears that at the present time there are fewer of these "Bee Trees" than there used to be, and that the number of the combs in each tree has also decreased. It is possible that this is directly due to the development of the Coffee Estates which do not favour the growth or preservation of trees suitable for these Bees to build on. The combs are occasionally robbed, the trees being climbed at night and the combs cut with a knife under the protection of a torch and a *kumbli*. There appears, however, to be no organised system of destruction of these combs and, where these are situated within estate limits, it is within the power of the Planters to put a stop to such practices. There is a large colony of *A. dorasta* underneath the arches of the Sidapur Bridge and, when these combs are robbed, the bees are said to make the road practically impassable for traffic.

"The Indian Bee (*Apis indica*) builds in suitable hollow trees scattered throughout the wooded areas. The nests are robbed when found, but are not hunted for systematically.

"The Small Bee (*Apis florea*) builds in bushes, etc., almost everywhere. The nests are robbed when found, the honey being usually squeezed out and eaten on the spot. It would be impossible to protect this Bee, but Planters might do something to protect the nests of *Apis indica* on their own estates, as the taking of a nest usually leaves tell-tale evidence of chopped trees, etc.

"At Santikoppa I saw some of the mysterious holes in the ground of which so much has been heard and written. These apparently appeared about two years ago and are still visible in many places when the surface soil is removed. They consist of holes of such a size as to accommodate one's little finger and lead down into the ground for two or three feet, when they terminate abruptly. Often they are situated close alongside and parallel with the main stem of a Coffee-bush, and a half a-dozen or more are often crowded together within as many square inches. No probable author of these holes could be discovered in them when they were first noted, although they have been ascribed to Cockchafers which are common in the District. I am inclined to connect them with a species of Cicada, more especially as an unusual abundance of a Cicada seems to have synchronised with the appearance of the holes, whose general characters seem to correspond closely with the descriptions given of the seventeen-year Cicada in America. Possibly we have in Southern India one or more species whose habits and lengthy life-cycle are parallel to those of the better known American insect. (See also the *Planters' Chronicle*, 14th December 1912, page 683). The whole matter is certainly quite interesting from both the entomological and planting view points. It may be added that, although cockchafers are commonly accused of doing great harm in certain places to Coffee-bushes (particularly young ones in nurseries, etc.) and although they certainly may

do such harm when present in large numbers, yet they are probably not the only culprits in this case. We see that there is at least a possibility of the discovery of a long-cycle *Cicada* whose larvæ would live in the ground for any period up to, or even exceeding, twenty years, sucking the sap of young roots all that time. And even during my hurried visit I was able to collect several species of Tipulid Flies whose larvae are well-known as being root-feeders. The whole question of root-feeding insects of this sort demands prolonged and careful investigation on the spot by an Entomologist.

"My main object in going to Mercara was to visit Dunkeld Estate where serious injury had been reported as done to Cardamom fruits by a boring Scolytid beetle, but it proved impossible to proceed beyond Mercara owing to transport difficulties. However, I was able to see some Cardamoms at Mercara and found the same beetle in small numbers, the owner of the Estate affected estimating that about ten per cent. of his crop was spoilt in this way. No measures of control have been taken and without further local investigation it is difficult to suggest much beyond collection and destruction of all attacked fruit.

"Lantana grows freely on the hills around Mercara and attempts are being made to cut and burn it over certain areas and to keep such areas free of regrowth. In this connection it was interesting to note that Lantana here was freely attacked by a small Plume-moth (*Platyptilia pusillidactyla*) whose larva bores into and practically destroys the young seed-head, so that an attacked seed-head bears only three or four weakly-looking fruits whereas a normal unattacked head may bear fifteen or sixteen plump healthy fruits. A few caterpillars cut the leaves but such do practically nothing to check the growth of a plant like Lantana, whereas this little moth checks its spread directly by limiting its power of dispersal by seeds eaten and carried by Vertebrates."

The following note on Bees in Coorg appeared in the *Agricultural Journal of India* in 1908:—

There are two kinds of honey bees in Coorg, the large and the small. The former are not domesticated. Their nests are found on high trees, preferably *Lagerstroemia microcarpa*, and the wild mango tree, under the arches of bridges and public buildings and precipitous rocks. There is a hill in Coorg called Jain Kal Betta (Honey Rock Hill) where these bees have been settled from time immemorial. Their honey has an acid taste and is not much valued, but the wax is much sought after. It is a very difficult task to get at the hives, owing to the inaccessible position in which they are found. In Coorg, the Jain Kurubas, a jungle tribe, are adepts at taking the honey.

The small bees are domesticated not by the Kurubas, but by ordinary ryots. A large earthen pot is smeared inside with bees' wax scented by rubbing the leaves of the wild cinnamon tree on the wax. About a dozen small holes, ¼" in diameter, are bored into the pot, and bees' wax scented by the wild cinnamon leaves is rubbed round the holes on the outside. The mouth of the pot is closed by tying a cloth over it, and it is then placed upside down in the jungle, in a shady place. In time the pot will usually be found to be inhabited by bees. The pot is then very cautiously removed at night and placed in a dry place, free from ants, facing the east under shade. Some people have a hundred or more pots in their farm-yard. The bees are not disturbed by the people of the household. No attention, whatsoever, is paid to them till about June when the honey is removed. As a rule, all the honey is taken, but some careful bee-keepers leave at least one comb in each pot.

THE SCIENTIFIC DEPARTMENT, U.P.A.S.I.

Scale Insects.—Two specimens of Scale Insects have been received recently for indentification. The first proved to be *Lecanium hemisphaericum*, which is usually known locally as "Brown Bug." This scale was found on Coffee in a nursery. It is a common scale on Coffee in all the planting districts and at times does considerable damage. It is not usual to find it in a nursery and it probably got there from some tree or plant near by, which should be hunted up and destroyed.

This scale varies from a pale brown to a deep chestnut in colour and is hemispherical in shape as its name implies. In the younger forms there is a crest running along the middle of the back with two side ridges on each side. The surface of the scale is smooth and polished. When full grown each scale becomes a mere shell filled with innumerable pale pink eggs, while at this stage the inner marginal surface is covered with a white mealy powder and, when a scale is detached from the plant, it leaves an oval white ring marking its former position.

It is a very common scale indeed and Green says of it, "habitat on leaves, twigs, and branches of coffee, cinchona, tea, and innumerable other plants, amongst which may be mentioned *Adiantum* and other ferns, asparagus, gardenia, gauva, *Coboea*, *Anthurium*, *Loranthus*, bamboo. In fact, the species may be considered as omnivorous as it is cosmopolitan. It has been recorded from almost every country in which Coccidae have been collected in both hemispheres."

Luckily it has many natural enemies in the nature of minute hymenopterous parasites and these tend to keep it in check. When a bad attack occurs, however, it should be sprayed with Vermisapon, or Kerosine-soap-rosin mixture. In the case of a nursery spraying operations are very simple and easy.

The second scale was on a species of *Anona* and proved to be *Ceroplastes actiniformis*. This is not a very common scale and it is easily dealt with. Under a lens it is a very beautiful object being of a delicate pink colour, the central area domed, and sides composed of a series of eight shield-like plates each with a depressed centre and separated by marginal indentations. It is easily killed by the usual sprays.

Use of Fertilisers.—The following from *The Gardener's Chronicle* is not without point:—

"An interesting example of the need for a proper comprehension of the mode of action of artificial manures is supplied in an anecdote related in Part VII of *A Pilgrimage of British Farming*. The writer of this interesting series of articles, now appearing in *The Times*, gives an account of a farmer who, as a concession to new ideas, determined to apply 10 cwt., to the acre of superphosphate to one of his fields. This he did, with excellent results. Thus encouraged, he increased the application to 16 cwt. in the following year on the same field, and, not unnaturally, got little or no crop. He then reverted to the use of dung, and obtained a magnificent return, because, with the nitrogen of the dung, the hitherto unused phosphate came into action. The conclusion which the farmer drew was that superphosphate and such like manures were foolishness, and that dung alone was good. The anecdote illustrates the need for the constant reiteration of the fact that the mineral needs of plants are various, and that it is not possible to satisfy a plant hungry for nitrogen with an excess of phosphates or something else. The wise gardener makes use of both dung and artificials."

R. D. A.

DISTRICT PLANTERS' ASSOCIATIONS.

Wynaad Planters' Association.

Proceedings of the Annual General Meeting held at Meppadi Club on January 22nd, 1913.

PRESENT.—Messrs. Bownass, Egan, Gillatt, G. R. C. Parker, Powell, Stewart, C. E. Abbott, (Honorary Secretary.) *Visitor*: Mr. G. R. Briggs, Mr. Egan in the Chair.

1815. *The Proceedings of the last Meeting* were confirmed.

1816 *Perrendatty P. O.*—Read letter from Honorary Secretary, and reply from the Postmaster-General, Madras. It has been laid down by the Director-General of Posts and Telegraphs (Order No. 216, dated Simla, May 19th, 1910) that in all cases where experimental offices are opened at the request of private individuals, the persons interested shall be required to make a non-returnable contribution towards the total expenses representing the establishment charges of the office, and of the separate line, if any, opened for their benefit. Recorded.

1817. *Meppadi Church.*—Read letter from Rev. H. Jones, Chaplain of Calicut thanking the Association for voting a sum of money for the repairs of this church.

1818. *Chenal Mulla Bridge.*—Read correspondence ending with a letter from the Assistant Engineer dated January 5th, 1913, stating that funds had been provided for this bridge, and that the work would be started shortly. Recorded with satisfaction.

1819. *Election of Honorary Members.*—Mr. H. Waddington who has recently left the District after being a Member for several years and who was Honorary Secretary in 1907-1908 and Dr. F. Milton Principal Medical Officer of the East India Tea and Produce and Meppadi Tea Companies, were elected Honorary Members.

1820. *Rules of the Association.*—Read report of the Committee made in accordance with resolutions passed at May and November Meetings 1912. This was agreed to. The rules as amended were ordered to be printed and circulated.

1821. *Shipment of teas during the Monsoon.*—Read correspondence in connection with the Special Meeting of this Association held to consider the question of complaints of tea shipped from Calicut and received in London in a damaged condition. Letters from Honorary Secretary to Messrs. Peirce, Leslie & Co., Messrs. Parry & Co., and Messrs. Harrisons & Crosfield in Calicut, and their replies. The following resolution was proposed by Mr. Gillatt, seconded by Mr. Stewart and carried. That this Association do ask the Honorary Secretary to write to the Coast Firms and point out that as all of the invoices despatched from this District from various Estates and shipped by the Clan Fraser during August have been reported on by the Brokers in London as having arrived in a musty condition that considering no reports have been received from the Coast Agents, who shipped the tea in question, as regards the various invoices having been received in anything but in satisfactory condition, that it is the opinion of the Association that the damage must have been caused after receipt by the Calicut Agents

1822. *Shipment of tea from Madras.*—This subject which was also raised at the Special Meeting led to a correspondence with Messrs. Parry & Co., Madras, who are prepared to undertake to ship tea sent by this

route ; their charges from rail to ship being 8½ as. for full chests and 6¾ annas for half chests. This rate would include warehousing for 4 weeks. It is unlikely that any cargo would be detained longer ; but if it were, the cost would be 4·4½ pies per chest per week. Messrs. Parry & Co. shipped a quantity of tea from the West Coast at Madras during the 1909 monsoon with satisfactory results.

The S. I. Railway Traffic Manager writes that he is unable to further reduce the freight on tea from Calicut to Madras which remains at 6 annas per maund. The cost *via* Madras would therefore amount to, say, for a full chest, weighing 120 lbs. gross

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in addition, to whatever was charged for forwarding in Calicut ; against the present cost of 6 annas per chest, for shipping from Calicut.

1823. *Vayitri Munsiff's Court.*—Read letter from Honorary Secretary to Mr. Edgington, I. C. S., District Judge of South Malabar, about the statement in the *Madras Mail* that this court was to be removed to Feroke ; and Mr. Edgington's reply informing that the information is inaccurate the proposal being to invest the Deputy Collector of Wynaad with Munsiff's powers, so as to set free the Munsiff for work in the plains.

1824. *School of Tropical Medicine.*—A circular has been received from Messrs. Harrisons and Crosfield asking for subscriptions to above, these should be sent to the Firms Quilon Branch.

Roads.—Read letter from Mr. Winterbotham complaining of the late date at which repairs and jungle cutting are being undertaken.

1826. *Postal Delays.*—Read letter from Mr. Winterbotham. The Honorary Secretary to write to the Superintendent of Post Offices, Calicut, about the detention of Wynaad parcels in Calicut.

1827. *Annual Report and Statement of Accounts.*—The Annual Report was read and ordered to be printed.

ANNUAL REPORT.

There have been eight meetings held during the year. We have lost two Members during the year one Mr. Atzenwiler by death and one by resignation. We have also heard with regret the death of Mr. Mackinlay who resigned when leaving India. Both his and Mr. Atzenwiler's names appear on the first list of Members of this Association when it was formed in 1873.

The member whom we have lost by resignation is Mr. Waddington whose departure from the District we all regret. He was a member of this Association for several years, he has represented the Association at Bangalore and was Honorary Secretary in 1907 and 1908. We have now 31 members on the roll, besides Honorary Members.

Rules and Membership.—This question has been postponed from time to time, and it is hoped it may now be considered settled.

Roads.—The only complaints that have reached the Association concerning District roads have been about the delay in consolidating metal, and the Coorg-Kartikolam Road which Mr Jackson describes as being in very bad order.

His complaint has been forwarded to the President of the Taluq Board, but no reply has yet been received. This road is the link between

Wynaad and Coorg, and the Coorg authorities keep it in good order to the frontier: but the 10 miles between that point and Kartikolam appears to be neglected. The funds allowed Rs. 150 a mile, should at least suffice to keep it in fit condition for traffic as a fair weather road.

The Sultan's Battery—Nellakotta road always a difficult one to keep up has been put in good order. Funds have been provided to rebuild the Chural Mulla bridge on the Vellera Mulla Road.

Town Nuisance Act.—Our request to have this Act applied to Meppadi has been complied with with satisfactory results.

Tea Cess.—All the Indian Tea Districts have joined in asking Government to renew the Cess for another 5 years. This request has now been complied with. Mr. J. Carson Parker, the U. P. A. S. I. Representative on the Tea Cess Committee, nearly succeeded in persuading that body to grant a bonus on the export of green tea.

Labour and Emigration.—As far as local conditions go I think there has been an improvement. But we have all felt the extra cost of work involved by the increase of coolies pay. There was a good deal of discussion at the Bangalore Meeting on this subject and it is obvious that the constant drain caused by emigration to the Straits and Ceylon is being felt not only by planters, but by native landowners, and by those Government Departments who are large employers of labour. Government will not interfere to prevent a cooly who can only earn 2 or 3 annas in his village going abroad to earn more. But they ought to see that ignorant coolies are not enticed to emigrate on false pretences. As Government's attitude is one of perfect contentment with the conditions under which emigration is carried on, we can only do our best to show coolies that they are better off in Indian Planting Districts than elsewhere. Mr. Martin has done valuable work for us by composing the labour advertisement which has attracted considerable attention. We ought to continue to work upon these lines and try to arrange as far as possible to avoid inter-district competition. A scheme of voluntary registration was brought forward at the Bangalore Meeting, and a Committee was appointed to receive the opinions of all District Associations on it, to harmonise them and to circulate a working Scheme before the next Annual Meeting with the idea of improving the labour position. As I had an opportunity of consulting you before I went to Bangalore, I stated that Wynaad would only agree to Registration if it received Government support in seeing that coolies indebted to planters in India did not emigrate. You have confirmed that. It seems plain that Maistries and Coolies would at any rate at first be alarmed at being registered, and that if they found they could avoid the process by emigrating, the inducements to do so would be increased. As Chairman I have taken steps to insure that every member of a District Association should have the opportunity of studying the proposals so that he could form an opinion on them.

The Committee have now received the views of most of the Associations. One is strongly in favour but does not think it goes far enough, one supports it on condition that the Registration Bureau is made a department of the U. P. A. S. I. Two Associations have frankly declared that they consider the Scheme unsuitable and will have nothing to do with it. The attitude of other Associations may be perhaps described as non-committal.

The Committee will be undertaking a difficult task if it attempts to produce a report that will please everybody.

Locally, we have had as much trouble as usual in getting defaulters arrested after warrants had been issued against them. Mr. Mullaly, the District Superintendent of Police, North Malabar who came to our Meeting in May suggested that planters in doubtful cases should enquire of the local Police as to the Maistry's standing before advancing him. This proposal which was accepted by us as likely to be of considerable assistance was agreed to by the Deputy Inspector-General, but was vetoed by the Inspector-General.

Sale of Westward Ho Bungalow.—This was sanctioned by the Association and carried through.

The Bungalow was built 12 years ago on the Panora Coy's land for the District Medical Officer to live in, and was occupied for about 6 years. The money was raised by the subscribers to the Medical Fund, not by the Association, but the deed was in the name of the Association. When the last Medical Officer left, the Bungalow was occupied by the Panora Co., on the understanding that if required again for a Doctor's residence it was to be given up. There was a movement early last year to get a European Doctor for the whole District. When this fell through, Mr. Malcolm offered to buy the bungalow, and after some negotiations a price was agreed on, and the transaction completed. When the purchase money was received it was decided to give grants out of it for repairs of Meppadi Church and improving the Meppadi and Vayitri Clubs. These are shown in the Accounts. But it should be clearly understood that none of the payments have come out of the money subscribed for the Wynaad Planters' Association.

S. I. P. Benevolent Fund.—I would again draw your attention to the small number of subscribers in this District. There are only 6. The Fund ought to be supported by Members of Association and by Proprietors. The individual subscription is only Rs. 10 a year. The payment of Rs. 200 by a Proprietor or by a Company, entitles the Superintendent of any one Estate to be helped by the Fund during the lifetime of the Proprietor or for 20 years in the case of a Company. Happily we have not so far had many applications for assistance, but some hard cases have been helped. Anyone who reads the report of the Ceylon Planters' Fund will appreciate what good work may be done, and also how largely the Fund is supported there.

The Accounts for 1912 are now before you for examination, and I ask you to pass them if found correct and to accept my resignation.

The Accounts were passed and the sum of Rs.61-2-9 which appears to be irrecoverable is to be written off. Mr. Abbott was thanked for his services during the year, and was re-elected Honorary Secretary.

1828. *Meetings in 1913.*—It is proposed to hold the Ordinary General Meetings on the first Wednesdays of each month, except February, April, May and June.

A vote of thanks to the Chair terminated the Proceedings,

(Signed) C. LUMSDEN EGAN,
Chairman.

(„) C. E. ABBOTT,
Hony. Secretary.

Note.—Mr. G. R. Briggs will be proposed for election at the next Meeting.

EXPLOSIVES AS AN AID TO AGRICULTURE.

We lately published an article under the above heading by a correspondent, but it must not be thought that this subject had been overlooked by us, and that it came as a surprise. On the contrary it had been followed carefully and further information was being collected. The use of Explosives in opening up new land is not a new one, but has been in use for some time in the Colonies, South Africa and America. The amount of Explosives sold to farmers in America amounts probably to 600,000 cases and in the Transvaal 800,000 cases, but many difficulties will have to be faced and overcome before the use of explosives becomes general in the East. It is with its application in opening up new land in India that we are most concerned. It is hedged round with all sorts of precautionary laws. Plans for special houses for storage have to be built in places submitted to and passed by an Inspector of Explosives and licenses obtained. These are obstacles that can be overcome, but at present the chief obstacle undoubtedly is that of transport. Most estates are situated far away from Railway communication and Government would require before giving permission for its transport a long miles of road, to issue rules and regulations, harassing in themselves, but necessary for the public safety. Transit will add considerably to the cost but this will be faced and overcome by the planter who has mastered greater difficulties and expenses in the past. The question will arise is the cost justified? We believe it will be. Looking to the future, the planter and agriculturist will do well to face the initial expense foreseeing fields of tea, coffee and rubber without terrible eyesore of patches going out from stump rot. The eye of the agriculturist will be gladdened by fields of bumper crops of cereals due to deeper cultivation than can be reached by the plough. Prevention will be better than cure in such a case, if as we are assured "deleterious soil bacteria are destroyed in the process." This applies to the opening up of large areas of land for rubber, tea coffee and all cereals, but there is no reason why with reduced charges which must be learnt and tested by experiment, explosives should not be tried in growing fields with the best results. The present system of close planting will be revolutionized. Fewer trees will be planted to the acre and consequently less expense will be incurred per acre. For the first few years weeding will be slightly more expensive but the plants finding more generous feeding ground will expand and cover the ground and crops will increase abundantly. The expense entailed by the use of Explosives will be far more than covered by the returns due to more room and light and freer soil to feed on.

Professor Bose and Sir James Dewar have shown the relations between plant and animal life are analagous, and if man was treated in the same way as a plant his growth would become stunted. The roots of a tree require as much attention as the leaves themselves. We take from the America Agricultural Bulletin entitled the Breath of Life the following:—

"*Everyone is familiar with the way in which animals breathe* but many never stop to realize that plants—ordinary corn, cotton, grass in the fields—have organs of respiration that are just as elaborate as those of animals. The nostrils and the lungs of the animals are replaced in the plants by tiny openings in the leaves and roots that have such thin coverings that they can absorb air. The leaves have at all times an abundant supply of air from which to draw just what is wanted but the roots are not all times so favoured. If the roots are insufficiently supplied with air they are not able to do their work properly and the leaves are held in check at the same time by the faulty development of the roots.

"Some of the things that are necessary for the proper development of the roots are air, moisture foods that will dissolve in the soil water, temperature that is not too cold and a soil in which it is possible to spread out and grow easily.

"Most of the breathing of the plant is done by the leaves, yet a small but necessary part is carried on by the roots. This renders it necessary that the soil be well ventilated by numerous small openings between the particles. The water-logged or very wet sub-soils act the same as the packed soils in excluding the air; for the air cannot pass down through the openings choked up with excessive amounts of water. Some plants like Cypress tress overcome these conditions by root modification which allow breathing, but the crop growing in the fields and garden cannot do this, so it is necessary to furnish them air down in the ground. The plant root must also take up from the soil all the mineral food necessary for its development. These must be in such form that they will dissolve in the soil moisture readily enough to keep the plant from starving.

"Many of the minerals furnishing these necessary foods are too slowly dissolved to be of benefit to the plant until they are acted upon by the air and are caused to undergo very great changes. These changes are brought about but slowly in tight clay soils, sub-soils and hard-pan. While these changes in the nature of the minerals are being made by the air, great hosts of small bacteria are assisting in the same work. Some helping to break down one mineral and some another. These classes of bacteria must have an abundant supply of air for if caused to remain at any length of time in foul air or without air, they die and are replaced by others that may set about to undo the work already accomplished."

The above shows how necessary it is to cultivate the roots of a plant. The loosening and deepening of the soil, giving roots free scope to spread cannot but have the best results. Who, among planters, has not seen the effect on their own estates of some monarch of the forest blown down and uprooted in a gale of wind and the subsequent marvellous improvement of the growing coffee. This is due to the soil having been disturbed and fissured to a depth not possible for a manual labour to reach. To achieve the same object the use of explosives should be experimented with, though it should be remembered that in other countries their use has gone beyond the experimental stage. "Capital" in a leading article on the subject, says "before taking final leave of the subject, the experience of a lady fruit grower in Oregon is worth referring to. She has tried both methods of planting and is enthusiastic in her appreciation of the dynamite system. The trees planted in her dynamite holes grow twice as quickly as those set in the usual spade holes, and the difference between the two systems with trees of the same age set side by side was very marked. This lady was so impressed with the success of this method and the stronger and more luxurious growth of the trees planted in this manner, that she planted one whole orchard entirely with dynamite. In fact she has become so wedded to the system that she broke sticks of dynamite in halves and used a moeity for each tree of a rose bed, as well as planting the perennials in her flower borders in the same way. And in every instance the end had more than justified the means."

To those who are so happily situated that they can call in the aid of electricty to explode numerous charges at once, instead of one at a time, the cost will be considerably reduced. We are of opinion the system advocated should be given a trial. We are much indebted to the *Indian Planters' Gazette* for much of the information given in this article.

TEA.

Tea Pests in Ceylon.

(From the Report of the Government Entomologist.)

Tea Pest.

"Shot-hole Borer" (*Xyleborus fornicatus*) is still the principal subject of inquiry. There has been no marked increase in its range. I have occasional reports of its appearance on estates upon which it had not been observed before; but these have usually been situated in previously infected districts. The Dikoya and Maskeliya districts and the greater part of Dimbula still remain free, and may continue to escape infection of care if taken to avoid the introduction of tea plants grown in infected localities. There is no doubt that the best would never have established itself so widely had it not been for the constant employment of outside nursery plants instead of seed. If all plants for new clearings were grown on the place where they were required, there would be little or no danger of the introduction of the borer, for seed is never infested.

At the instance of certain districts, "Shot-hole Borer" has been proclaimed as a pest under the Plants Pests Ordinance of 1907. This Proclamation appeared in the *Government Gazette* No. 5498 of April 12, 1912, p. 387. The schedule recommends the "prohibition of the removal of tea plants or parts of tea plants (other than leaf for manufacture and tea seed) from estates infested by the borer, or the reception of such plants or parts of plants or any estate within the prescribed area." No action can be taken until a local board has been appointed and, when that has been effected, action is restricted to the "revenue district" governed by that Board. The appointment of a Board is dependent upon the wishes of the planting community in any particular district, expressed through their local Association. It is clearly not in the interests of any badly infected district to be placed under the Ordinance. Being already infected, they have little to gain and something to lose, as they would then be prohibited from disposing of their surplus tea plants. If, on the other hand, a district that is at present free from the pest is provided with a Board under the Ordinance, it has everything to gain but nothing to lose, for it could insist upon the prohibitation given in the schedule, namely, against the reception (by any estates within their area) of plants from an infected district, while, being themselves uninfected, there is no bar to the sale of their own plants. At present they are at the mercy of any careless or thoughtless person who may be prepared to run the risk himself, regardless of the danger to his neighbours.

The question of the utility of the predaceous beetle (*Clerus formicarius*) as a possible enemy of "Shot-hole Borer," has been finally set at rest by the receipt of a few living larvæ of that insect. It was at once apparent that these larvae were several sizes too large to be of any use to us. When quite young, they might be able to traverse the minute galleries of the borer; but they would soon outgrow this possibility. They would be unable to complete their transformations and, consequently, could never establish themselves permanently in the tea bushes.

Tea Tortrix, Helopeltis and others.

"Tea Tortrix," (*Capua coffearia*) has been reported from several districts, but trouble from this pest has been much less general than in previous years. This may be due, partly to a greater amount of rain during the early months of the year, which favours disease amongst the caterpillars, and partly to better cultivation.

There has been a marked scarcity of complaints of other caterpillar pests. I have received no notice of "Nettle Grub" (*Limacodidae*). Isolated outbreaks of "Red Slug" (*Heterusia cingala*) and *Caradrina reclusa* have been reported from the Kalutara and Deiyaya districts respectively. Two instances of minor attacks of the "Small Tussock" caterpillar (*Orgyia postica*) have occurred in the Deniyaya and Balangoda districts.

Helopeltis, also, has attracted very little attention, a single complaint from the Galle District and another from Kadugannawa being the only instances that have been brought to my notice.

"Yellow Tea Mite" (*Tarsonymus translucens*) has been reported from the Galle District.

Calotermes militaris, a "white ant" that hollows out the stems of living tea bushes, still occurs sporadically on some of the Lindula estates. Apparently the only cure for this pest, which breeds inside the stems, is to dig out and burn the affected trees.

Some seedling plants from the Ambawella district were found to be badly infested by a large "eel-worm" distinct from the common *Heterodera radicola*.

A very remarkable case of Infestation of manufactured Tea by a Dermestes Beetle has been investigated. The tea was packed in the usual way and samples were retained in the Colombo Agent's Office. Those samples show no trace of infection. But when the chests were opened, in Europe, the tea was found to be alive with beetles and fouled by the dead bodies of their larvæ and pupæ. The lead lining of the chests was said to be imperforate. No explanation of the presence of the insects is, at present, forthcoming. The tea was otherwise in good condition, being dry and without any signs of decay. There was nothing that would appear to be attractive to an insect of this genus. Indeed, in the sample that was submitted to me, there was no evidence that the beetles had been feeding upon the tea at all. Closely allied species of *Dermestes* are known to attack and breed in hides bacon, dried fish, &c, If only a single chest had been affected we might suppose that some foreign matter had been accidently included in the tea. But chest after chest was opened and found to be similarly infested. The whole affair is a mystery.—*Ceylon Observer.*

The Rubber World says of North Borneo:—

In the Trade figures Estate rubber heads the list of increases, 149,000 lbs. valued at $352,000 having been shipped as compared with 54,000 lbs. valued at $196,000 in 1910. The report adds that "succeeding years should show this increase not only maintained but largely augmented as more estates come into bearing." Prices ranged well at the top of the market, Woodford Estate being actually at the head of the London November sales of smoked sheet: Padas Valley on one occasion realised 5s. 1d. per lb. On Pitas estate 476 trees planted in 1898 give an average of 3·84 lbs. of rubber per tree. Three more estates were expected to commence tapping in 1912. Very little disease is reported and the little has been kept well in check. A number of Chinese are planting rubber on their small holdings. With the exception of two estates which have failed "there is not an estate in the country which can be regarded as other than a fair investment."